APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,184	09/10/2003	Yadong Li	138543 (553-1077)	7486

45436 7590 02/14/2008	

DEAN D. SMALL
THE SMALL PATENT LAW GROUP LLP
611 OLIVE STREET, SUITE 1611
ST. LOUIS, MO 63101

EXAMINER
SMITH, JEFFREY S

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
02/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/659,184	LI ET AL.
	Examiner	Art Unit	
	Jeffrey S. Smith	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2007*.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *6,7,9,26 and 27* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6,7,9, 26, 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-7 and 26-27 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Abdel-Malek and Kamath, and further in view of U.S. Patent Number

6,674,879 issued to Weisman et al. ("Weisman").

For claim 6, Figure 2 of Abdel-Malek discloses receiving a processed data

stream from a processor (data signal 30 from the receiver is processed from an analog

to a digital data stream), dividing the processed data stream into data subsets

(subinterval divide 32), filtering the data subsets by using a speckle reduction filter to

produce filtered data subsets (threshold processor 38), and producing an image data

stream based on the filtered data subsets (scan converter 22).

Abdel-Malek does not disclose simultaneously filtering the data subsets.

Figure 7 of Kamath discloses dividing the processed data stream into data

subsets (step 72 partitioning data into regions and distributing regions onto processors)

and simultaneously filtering the data subsets (step 75 thresholding wavelet coefficients

of transformed data).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to include the simultaneous filter of Kamath with the speckle noise filter of

Abdel-Malek because Kamath provides the motivation at column 5 lines 3-7 of

peforming "a substantial amount of processing on very large data sets," which can occur

when "the data is in the form of images."

Weisman discloses changing values of the parameters between first and second

value sets to form a first and second image data streams; and simultaneously co-

displaying a first image and a second image on a common screen, wherein the first

image is generated from the first image data stream, and wherein the second image is

generated from the second image data stream (see the filter and enhance buttons in

figs. 5 and 7 and see col. 13 lines 2-4). The first image and the second image are

speckle reduced images using parameters of the first value set and the second value

set, respectively. Weisman shows four images that are simultaneously co-displayed on

a common screen, one of which is the raw image. The other three images are speckle

reduced images that are generated from different sets of parameters and are

simultaneously co-displayed on a common screen. The image next to the raw image is

the speckle reduced image. The image under the raw image is generated from edge

detection parameters applied to the speckle reduced image. The image diagonal to the

raw image is generated from color quantization parameters applied to the speckle

reduced and edge detected image. Weisman therefore shows three speckle reduced

images, generated using three different sets of parameters, that are simultaneously co-

displayed on a common screen.

It would have been obvious to one of ordinary skill in this art at the time of the

invention to include the simultaneous co-display of the filtered images with the speckle

reduction filter of Abdel-Malek and Kamath for the benefit of providing report generation

that improves the analysis of an ultrasound image at taught by Weisman in the abstract.

Claim 6 recites that the adjustable parameters are adjustable speckle reduction

parameters that are changed to change the amount of speckle that is filtered from the

image, and that the speckle reduction parameters used in the first image are different

than that in the second image. Weisman in col. 13 lines 1-6 states that "The physician

may then choose one of several processing combinations from menus. The default is

for processing average images with moderate speckle. However, the physician may

also choose options for light or heavy speckle."

The Supreme Court has held that in analyzing the obviousness of combining

elements, a court need not find specific teachings, but rather may consider "the

background knowledge possessed by a person having ordinary skill in the art" and "the

inferences and creative steps that a person of ordinary skill in the art would employ."

See KSR Int'l v. Teleflex, Inc., 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396

(2007). To be nonobvious, an improvement must be "more than the predictable use of

prior art elements according to their established functions." Id. Here the combination is

the predictable method of generating multiple speckle reduced versions of an image

(light, moderate and heavy, col. 13 lines 1-6) and displaying them with the predictable

method of simultaneously co-displaying multiple filtered versions of an image (figure 7),

according to their established functions.

One of ordinary skill in the art, after reading Weisman, can replace the multiple

filtered versions of a raw image that are co-displayed in figure 7 with multiple speckle

filtered versions of the raw image produced by the adjustable speckle reduction

parameters in col. 13 lines 1-6 to yield the predictable result of a simultaneous co-

display of lightly filtered, moderately filtered, and heavily filtered speckle reduced

images.

Claims 26 and 27, which are computer readable medium and apparatus claims

having elements similar to claim 6, are rejected for these reasons also.

Claim 26, similar to claim 6, does not limit the environment to an ultrasound

environment. For example, the claim does not specify that the simultaneously filtering

results in a speckle reduced ultrasound image. Even so, these features have been

cited in Abdel-Malek, Kamath, and Weisman in order to advance prosecution.

Claim 27 recites ultrasound in the preamble, however, the preamble is not given

patentable weight. The transducer array recited in the claim performs no function and is

unrelated to the other elements. The claim does not recite that the transducer array

generates ultrasound signals. Similarly, the claim does not recite that the beamformer

receives the ultrasound signals. The functions performed by the beamformer are not

specified by the claim. This claim reads on any system that performs simultaneous

filtering and displays two speckle reduced images. However, ultrasound has been read

into the claim in order to advance prosecution.

For claim 7, Figure 2 of Abdel-Malek discloses receiving a processed data

stream from a processor (data signal 30 from the receiver is processed from an analog

to a digital data stream), dividing the processed data stream into data subsets

(subinterval divide 32), filtering the data subsets by using a speckle reduction filter to

produce filtered data subsets (threshold processor 38), and producing an image data

stream based on the filtered data subsets (scan converter 22).

Abdel-Malek does not disclose simultaneously filtering the data subsets.

Figure 7 of Kamath discloses dividing the processed data stream into data

subsets (step 72 partitioning data into regions and distributing regions onto processors)

and simultaneously filtering the data subsets (step 75 thresholding wavelet coefficients

of transformed data).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to include the simultaneous filter of Kamath with the speckle noise filter of

Abdel-Malek because Kamath provides the motivation at column 5 lines 3-7 of

peforming "a substantial amount of processing on very large data sets," which can occur

when "the data is in the form of images."

Weisman discloses simultaneously co-displaying, in a dual display mode, a

filtered image and an original unfiltered image on a common screen, wherein the filtered

and the original unfiltered images are reconstructed from a data set that includes the

image data stream and the processed data stream (figures 5 and 7); and enabling a

user to enter the dual display mode at least one of during a scan and while a replay of

pre-recorded cine loops is displayed on a screen (col. 12 line 54 through col. 13 line 17

"Generally, the user of the workstation 10 can view the echo directly from the echo

machine (video source) 12, from digitized image sequences, or from videotape....

While using the workstation 10 of the invention, a physician viewing a study may wish to process (filter) the digitized images to improve their quality and diagnostic value.... A quad screen may be used").

It would have been obvious to one of ordinary skill in this art at the time of the invention to enable the user to enter the dual display mode for the simultaneous co-display of the images of Abdel-Malek and Kamath for the benefit of providing report generation that improves the analysis of an ultrasound image at taught by Weisman in the abstract.

Claim 7 is also not limited to an ultrasound image, nor is the filtering limited to speckle reduction filtering. In fact, a speckle reduced ultrasound image is not required by claim 7. This claim reads on any method that performs simultaneous filtering of an image, displays the filtered image and the raw image simultaneously, and allows a user to enter the dual display mode during a scan of anything or a replay of "cine loops" such as a video replay. Nevertheless, a narrow interpretation of claim 7 has been made in order to advance prosecution.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abdel-Malek and Kamath and Weisman as applied to claim 6 above, and further in view of U.S. Patent Number 4,887,306 issued to Hwang et al. ("Hwang").

Hwang discloses the filtering step is based on adjustable parameters, the method further comprising: automatically, without user intervention, optimizing the parameters based on a scan of an imaging system and what is being imaged (col. 2 line 48 through

col. 3 line 2 "A principle concept underlying the present invention is that speckle

contamination is usually more of a problem when imaging diffuse scatterers....

Examples of diffuse scatterers are the liver parenchyma and myocardium. In

comparison, high intensity ultrasonic echoes usually correspond to strong specular

reflectors.... Examples of high intensity echoes include those from the diaphragm,

cardiac valves and vessel boundaries. Temporal compounding, as practiced in the prior

art, applies the same degree of compounding to both diffuse scatterers... and the

resolved structures.... This problem is avoided in the temporal compounding technique

of the present invention.")

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify the speckle noise filter of Abdel-Malek, Kamath and Weisman to

adaptively adjust the filter parameters based on what is being imaged. In this case, the

particular known problem that an ultrasound of a liver produces more speckle than an

ultrasound of cardiac valves was solved by the known technique of adjusting the

speckle reduction parameters adaptively, without user intervention as disclosed by

Hwang. One of ordinary skill in the art can combine the simultaneous filtering of Abdel-

Malek, Kamath and Weisman with the adaptive filtering of Hwang to yield the

predictable result of simultaneously filtering data subsets adaptively based on what is

being imaged to generate a speckle reduced image.

Response to Arguments

Applicant's arguments filed December 31, 2007 have been fully considered but

they are not persuasive.

Applicant argues that "At no point does Weisman describe that the co-displayed

speckle reduced image, edge detected, and color quantization images may have

different levels of speckle reduction than each other."

The rejection does not make this assertion. The rejection holds that

> The Supreme Court has held that in analyzing the obviousness of
> combining elements, a court need not find specific teachings, but rather
> may consider "the background knowledge possessed by a person having
> ordinary skill in the art" and "the inferences and creative steps that a
> person of ordinary skill in the art would employ." *See KSR Int'l v. Teleflex,
> Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). To be
> nonobvious, an improvement must be "more than the predictable use of
> prior art elements according to their established functions." *Id.* Here the
> combination is the predictable method of generating multiple speckle
> reduced versions of an image (light, moderate and heavy, col. 13 lines 1-
> 6) and displaying them with the predictable method of simultaneously co-
> displaying multiple filtered versions of an image (figure 7), according to
> their established functions.
>   One of ordinary skill in the art, after reading Weisman, can replace
> the multiple filtered versions of a raw image that are co-displayed in figure
> 7 with multiple speckle filtered versions of the raw image produced by the
> adjustable speckle reduction parameters in col. 13 lines 1-6 to yield the
> predictable result of a simultaneous co-display of lightly filtered,
> moderately filtered, and heavily filtered speckle reduced images.

Applicant is requested to respond to the rejection that has been made in the

Office action.

Applicant argues that "Nowhere does Weisman describe that the user can enter

the quad display mode during the echo scan or while the echo is being viewed from

digitized image sequences or on a videotape."

Weisman discloses

> Generally, the user of the workstation 10 can view the echo directly
> from the echo machine (video source) 12, from digitized image
> sequences, or from videotape.... While using the workstation 10 of the
> invention, a physician viewing a study may wish to process (filter) the
> digitized images to improve their quality and diagnostic value.... A quad
> screen may be used.

(col. 12 line 54 through col. 13 line 17). This means that, while viewing the echo from

the machine, or from digitized image sequences, or from videotape, the filtering

methods discussed above can be applied to the images and the filtered images can be

displayed in the quad display mode, which reads on the claim element "enabling a user

to enter the dual display mode at least one of during a scan and while a replay of pre-

recorded cine loops is displayed on a screen." The fact that the images are "processed"

or filtered before the filtered images are displayed does not distinguish the claim

element from Weisman. Presumably, the filtered images that claim 7 is simultaneously

co-displaying are also "processed" or filtered before being displayed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jeffrey S. Smith whose telephone number is 571 270-

1235. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jingge Wu can be reached on 571 272-7429. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSS
February 6, 2008

JINGGE WU
SUPERVISORY PATENT EXAMINER